PHYS 401 – 501 SYLLABUS

Introduction:

This is the syllabus for PHYS401/501 Classical Mechanics. It is a double coded class, given to undergraduates and graduates with the same material. The homeworks and midterms may be different based on the level of class, 401 and 501 may have different homeworks and exams. The grading and the rest is the same.

I will use SU COURSE extensively for homework assignment/collection, announcement, sharing resources, etc.

I will use TOPHAT to ask questions. Join code: 310903

Contents:

0 introduction to class
1. Equations of motion
   Lagrangian
2. Conservation laws (homework 1)
   Energy
   Momentum
   Angular momentum
3. Integration of equation of motion (homeworks 2,3)
   One dimension
   Reduced mass
   Central field
   Kepler
3.5 Motion in non-inertial frames
4. Collisions (homework 4)
   Elastic
   Scattering
   Rutherford
   Small angle
5. small oscillations (homeworks 5,6)
   Free
   Forced
   Vibrations
   Damped
   Friction
   Resonance
   Non-linear
5.5 Continuum limit, waves
6. rigid body (homework 7)
   Motion
   Eulerian angles
   Symmetric top
7. canonical eqns. (homework 8)
   Hamiltons principle
   Poisson brackets
   Canonical trans
   Liouville
   Hamilton jacobi

Grading:
8 homeworks = 50 pts (I will have 7 best grades over each, 7pts each+ 1 point bonus for those who turns in at least 5 homeworks)
final = 35 pts
midterm=25 pts
Catalog over 110 points.

Books:
Landau Lifshitz – Mechanics (main book)
Goldstein – Classical Mechanics
Marion – Classical Dynamics of Particles and Systems
Fetter and Walecka – Theoretical Mechanics of particles and continua

Times, places, days, and SUCOURSE INFORMATION
If we can find a better day and time, these could change, but do not bet on it. I will take attendance, as per YOK regulations, but I will also honor registration override requests. You are on your own if you fail to attend the classes. The videos will be online.

Monday 12:40 – 13:30, FENS G049
https://sabanciuniv.zoom.us/j/92921183343?pwd=dUt3M1A0MkpiakFOYTNESHNEc29yQT09

Friday 14:40 – 16:30, FENS G035
https://sabanciuniv.zoom.us/j/96309880512?pwd=Uy9NZXM2MExzam9WbjZTQTIDT2ZwUT09

TOPHAT: 310903